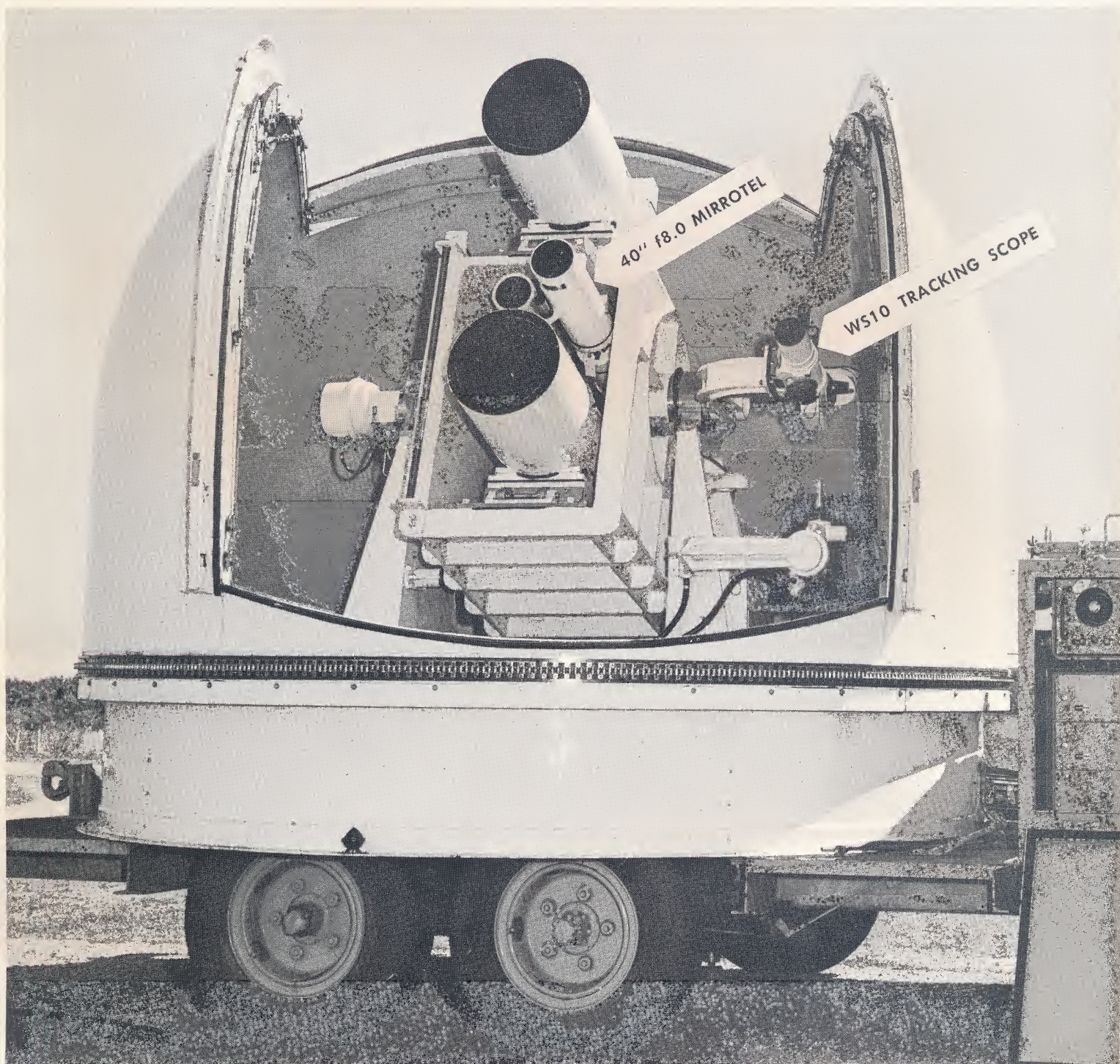


Experience, growth, facilities **Wollensak**



Introduction

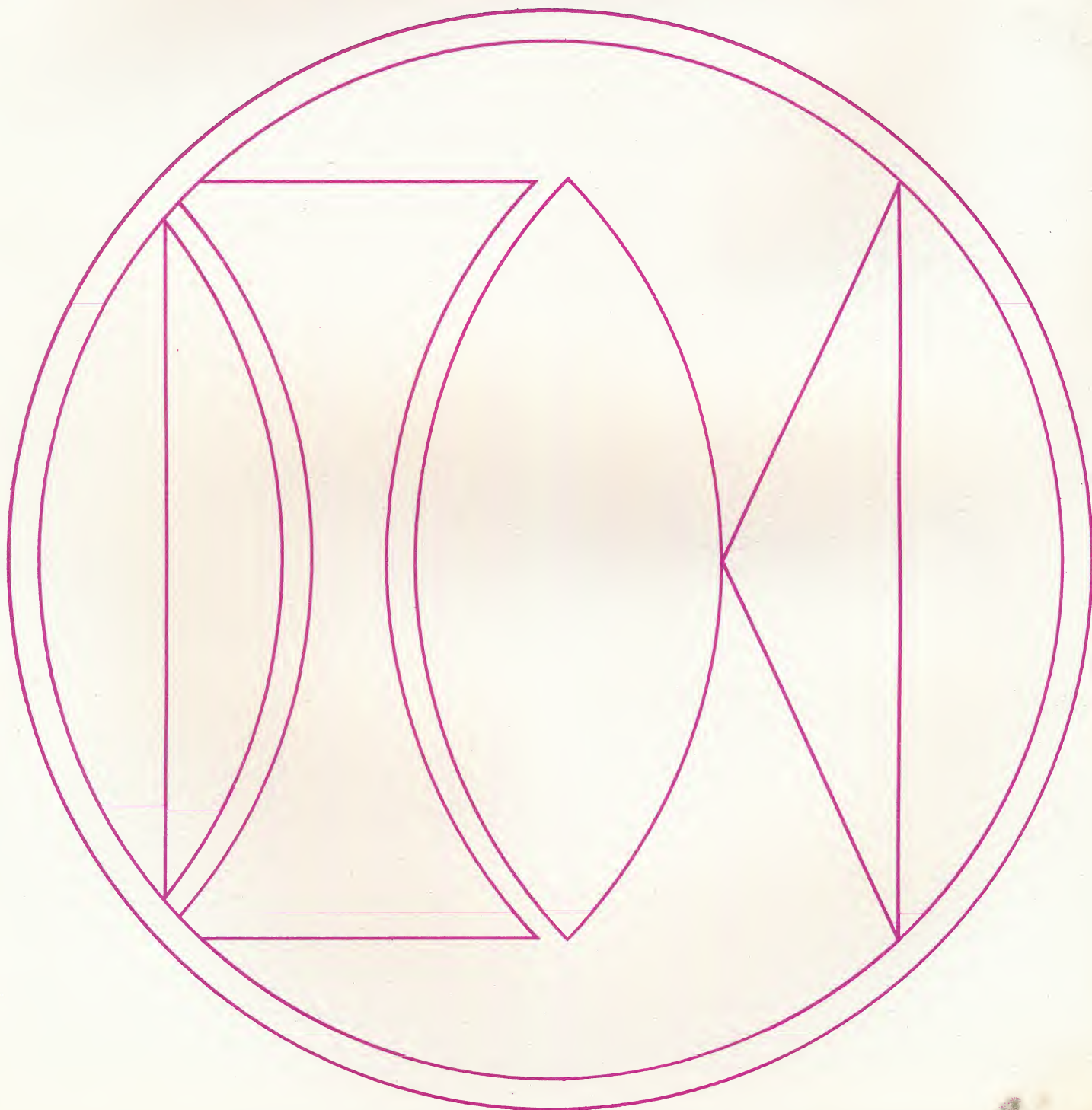


Since its founding in 1899, Wollensak has been known as a company which keeps abreast of the times. Indeed, in our business we not only must keep abreast of the times, we must keep *ahead*.

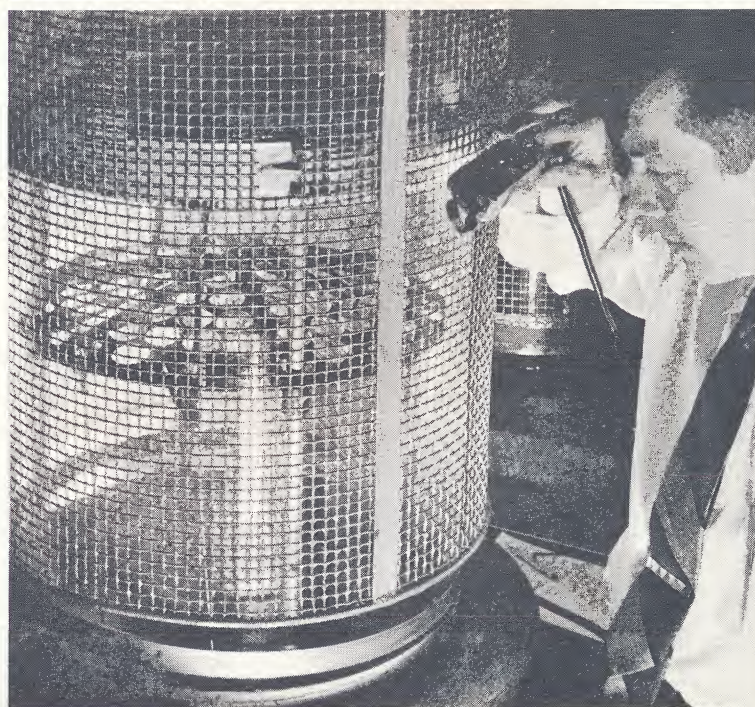
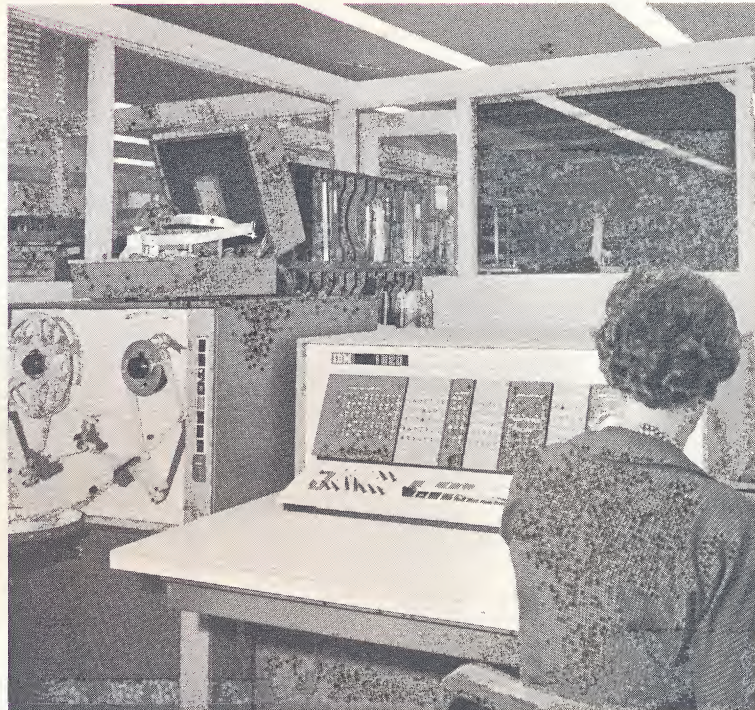
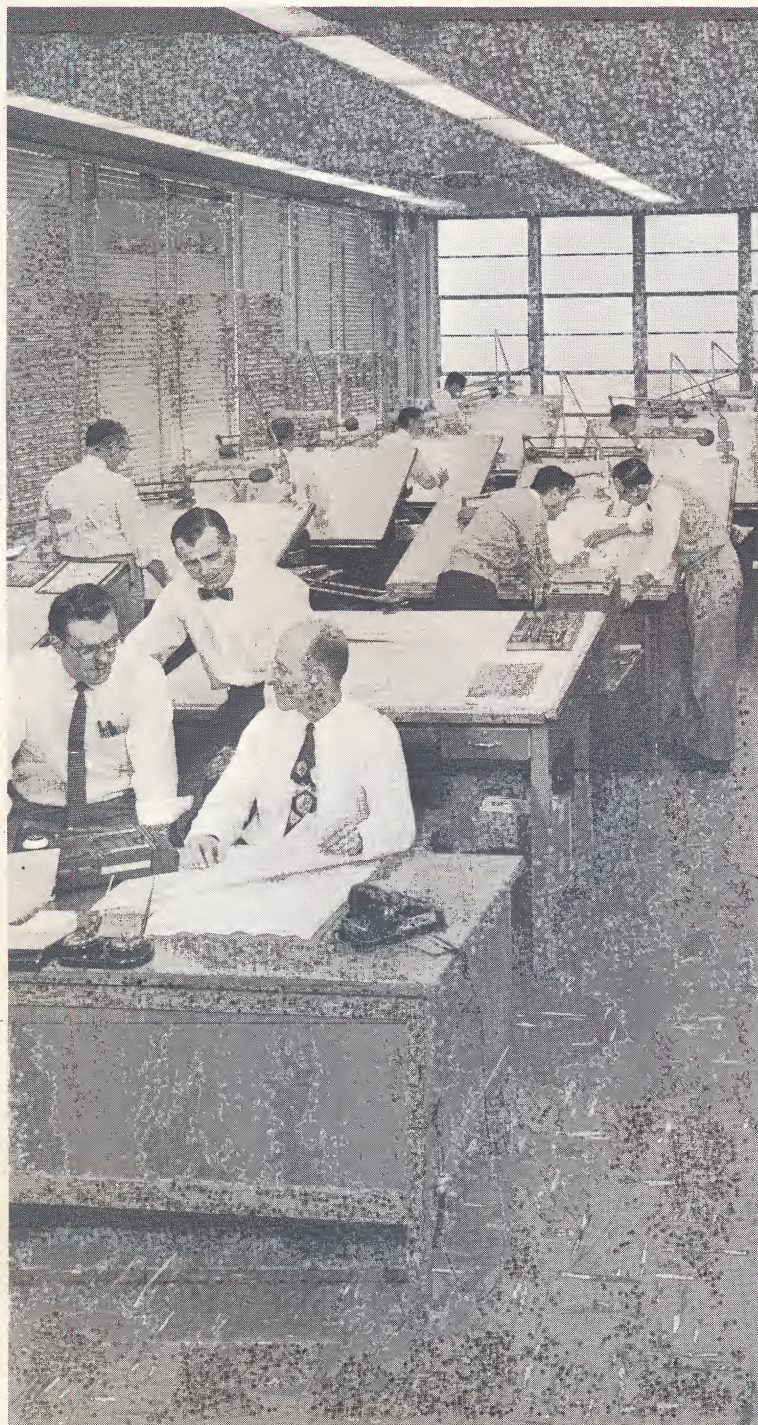
In little more than half a century Wollensak has progressed from the manufacture of shutters and single achromatic lenses, through two world wars, to the manufacture of such "space age" items as the Fastax high-speed motion picture camera (up to 18,000 pictures per second) and the complete opto-mechanical head assembly for the IBM Optical Reader ("reading" up to 400 documents per minute).

Such a capacity for rapid growth in many different directions implies flexibility and balance—and these two qualities are bywords at Wollensak. They provide us with the ability to move rapidly in a great variety of individual spheres—a necessity since we are concerned with the manufacture of a multitude of specialized customer-ordered products in the optical, opto-mechanical and mechanical fields.

Coupled with balance and flexibility, we offer experience and a creative imagination, enabling us to transform your needs into products which fulfill them.



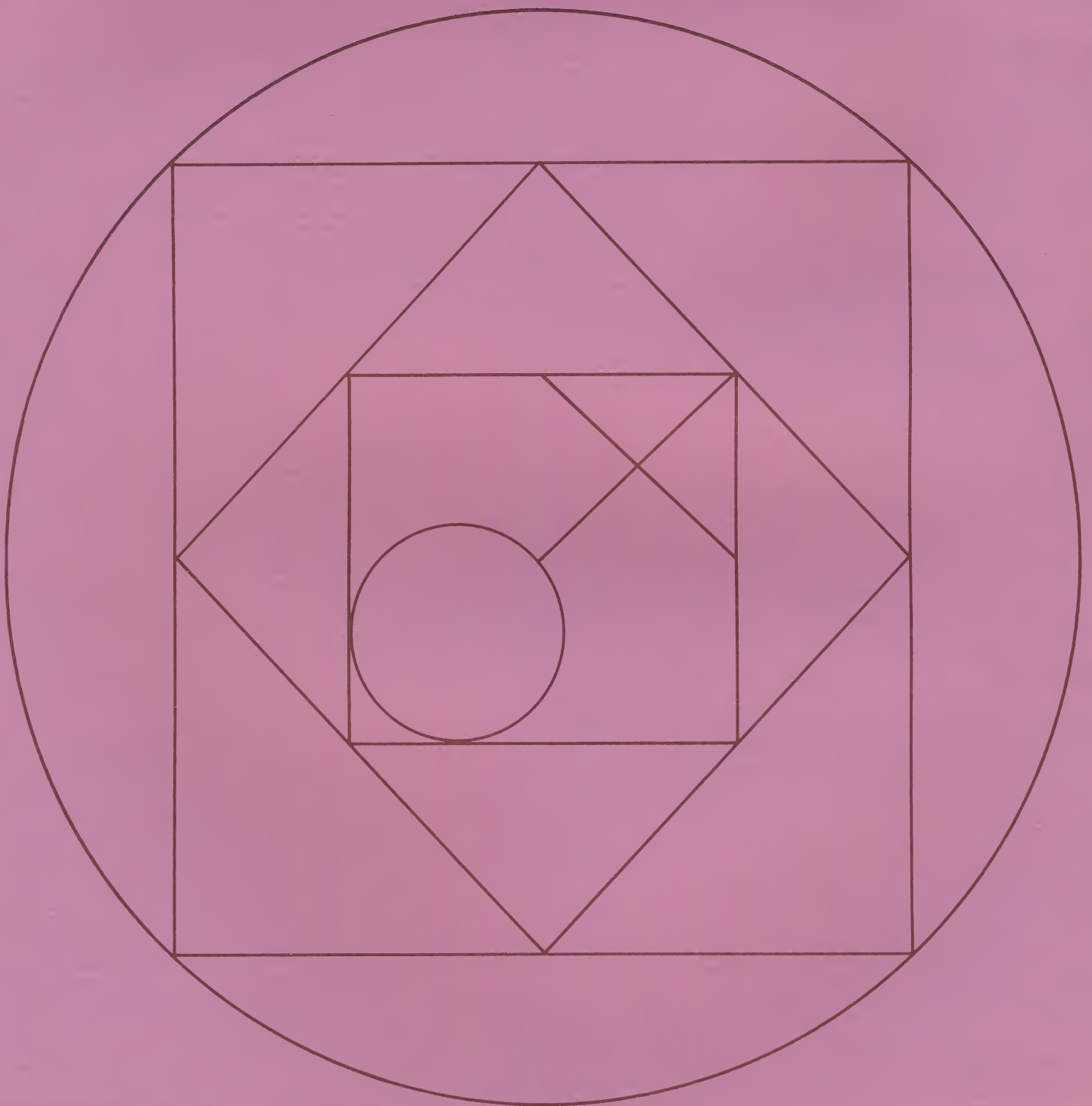
Wollensak-people and facilities



The craftsmanship which is a necessary ingredient in the manufacture of all our products is provided by employee ability and experience, plus the availability of precision equipment. Three fully equipped plants—Optical Molding, Optical Grinding and Polishing, and Mechanical—provide us (and you) with complete control of product from inception to completion. Complete laboratory facilities are also maintained for comprehensive performance testing under virtually every condition of environmental exposure, including temperature, humidity, salt spray, vibration and physical shock.

Wollensak's three plants offer extensive facilities. If these facilities are to fulfill their peak production potential, we must have imaginative, skilled men and women to use this great potential—*interested* people who are devoted to their work—devoted to the challenging task of turning out the kind of precise, dependable products that meet your requirements.

We have this type of person at Wollensak . . . in fact, we have more than 700 of them, approximately 40 of whom are engaged in Research Mechanical Design, Development Engineering and Test Engineering. These are the people whose talents we offer to you, our customer—people who *know* their business in the individual and combined optical, opto-mechanical and mechanical fields.



A fine example of Wollensak's capability as applied to a specific customer need is the manufacture of the complete opto-mechanical head assembly for the IBM Optical Reader. The "Reader" is a precision system which accepts reflected light from the document to be recorded, analyzing and recognizing each character of the document, then passing this information along until the complete document is subsequently recorded and filed in the form of cards, magnetic tape or printed reports. The "Reader" can process up to 400 documents a minute, filing them in perfectly organized fashion—permanently and accurately. It has obvious applications in nearly every industry imaginable.

Another representative, though vastly different example of Wollensak capability is the lens elements, enabling the operator of a grinding machine to see on a translucent screen an enlarged view of what he is actually grinding, no matter how intricate the work. This affords him continuous operation, with no interruptions for inspection.

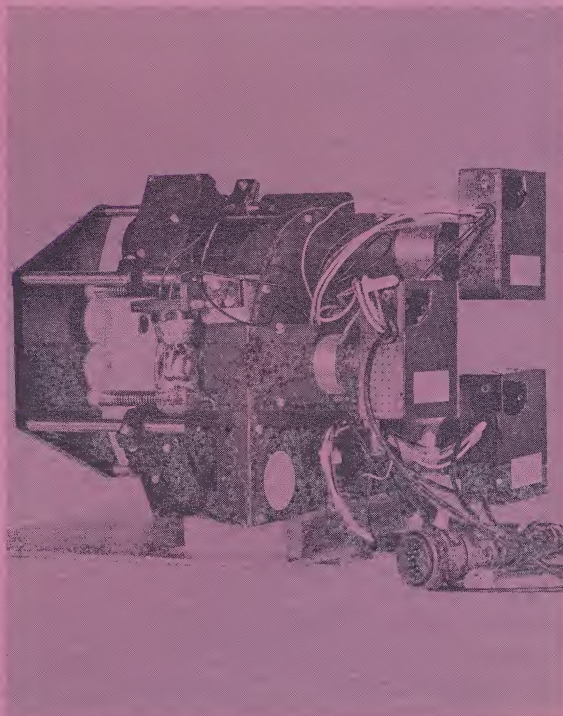
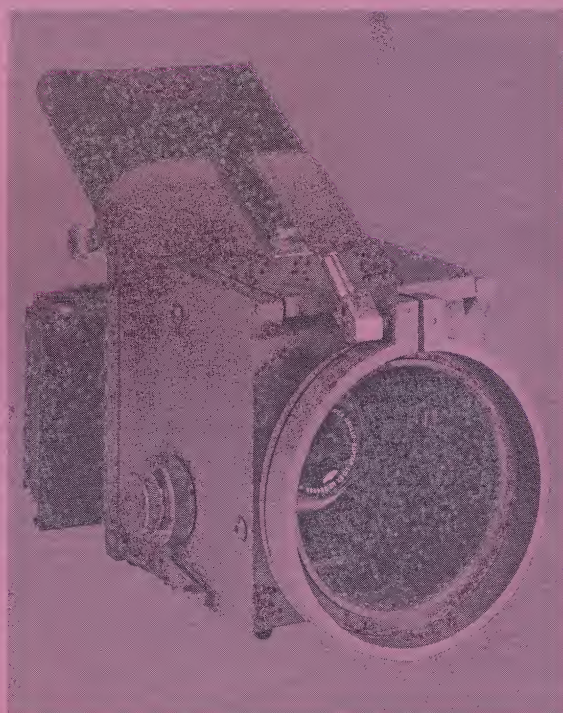
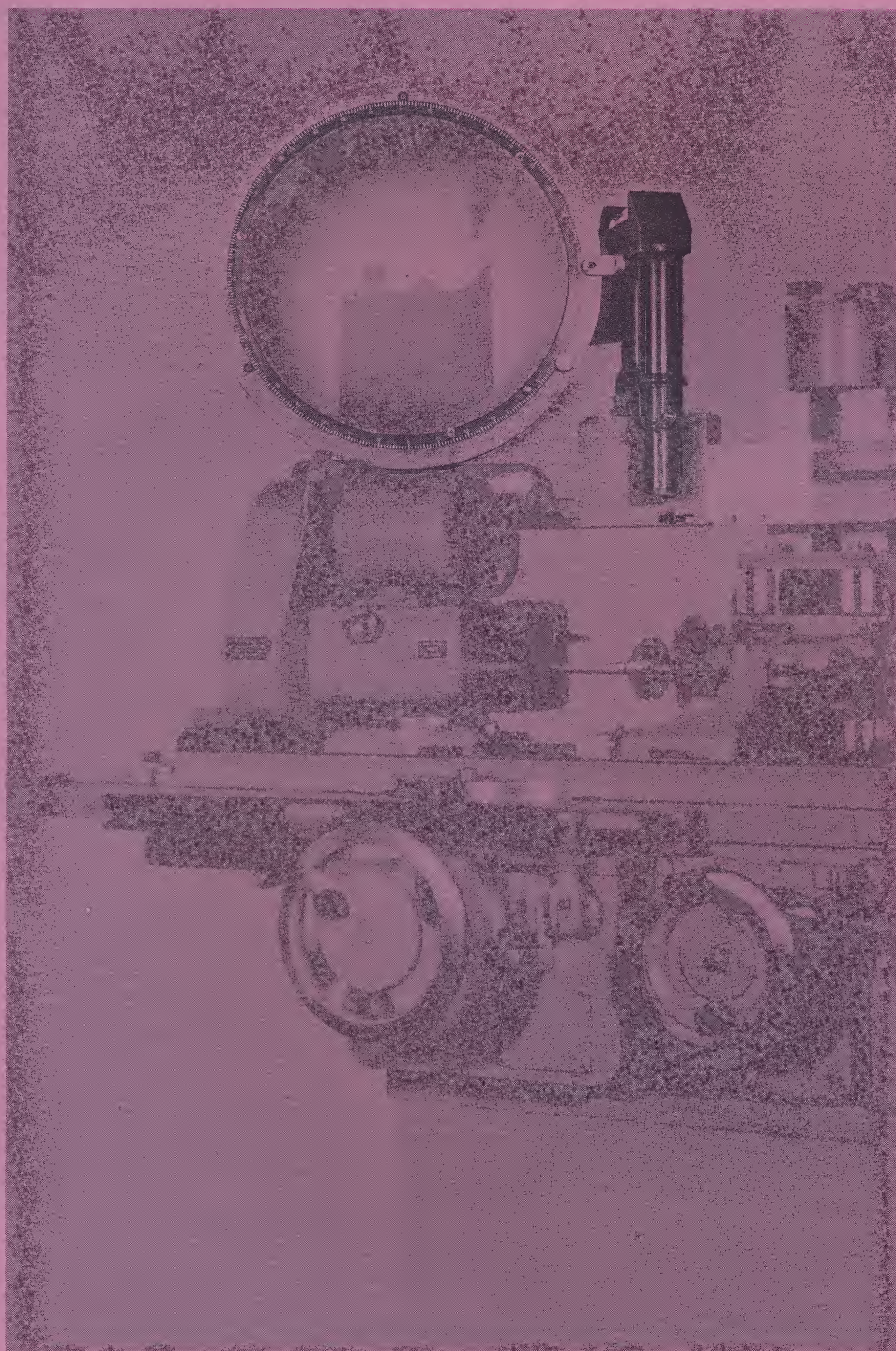
The savings in time, money and man-hours are obvious. The same grinding job that was once a painstakingly slow "start and stop" operation can now be performed simply, easily, visually—from start to finish.

The Oscilloscope Camera, designed and manufactured by Wollensak, is specifically intended for the sequence analysis of a host of different mechanical functions.

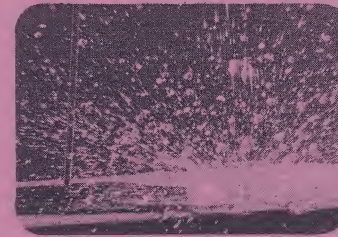
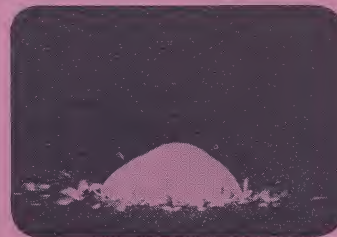
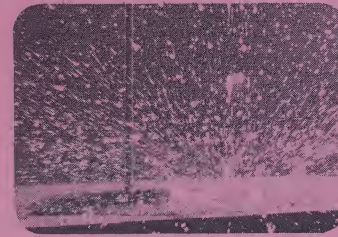
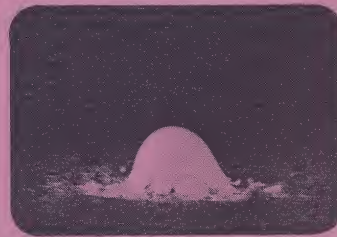
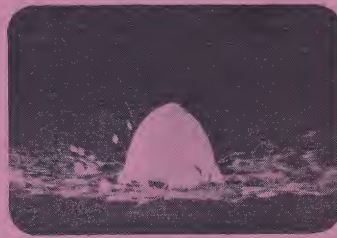
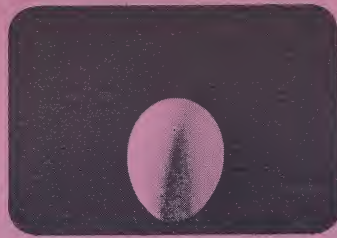
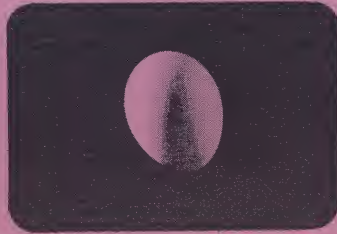
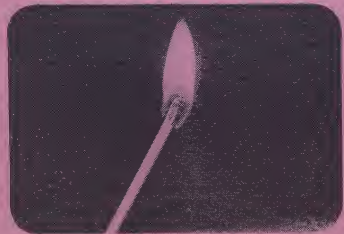
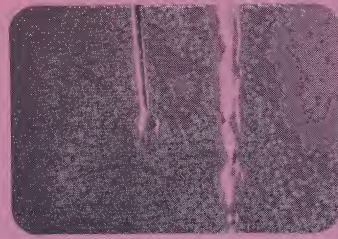
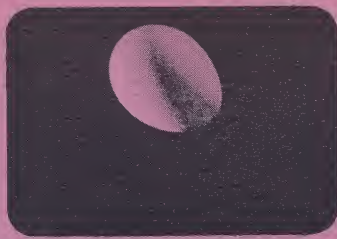
With its oscilloscopic visual tracing system, the Oscilloscope Camera gives an accurate, easy-to-evaluate reading of everything from the opening and closing characteristics of a shutter to the exact length of contact between two precision moving parts. The Oscilloscope Camera is widely used in numerous industries as an oscilloscopic-photographic analytical tool.

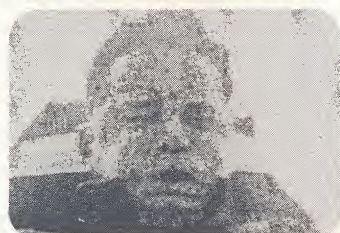
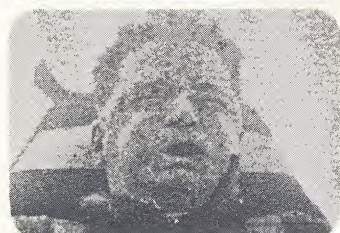
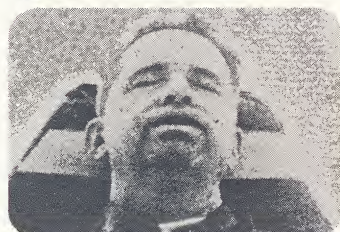
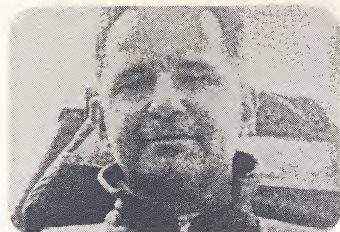
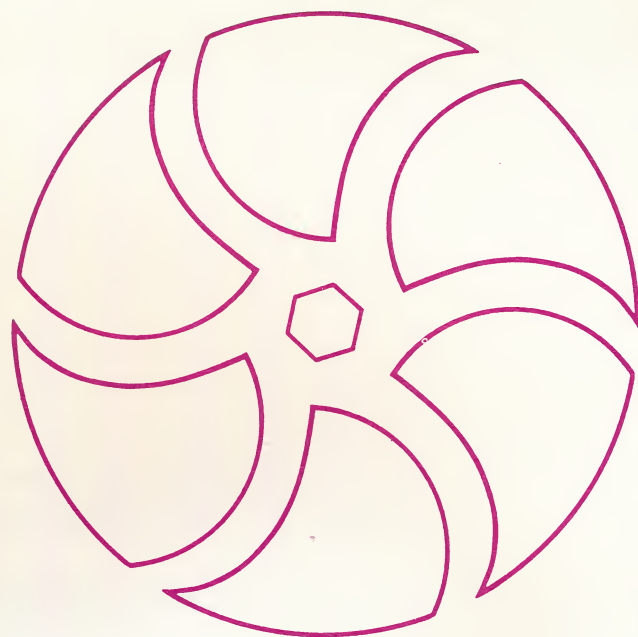
As diversified as these examples are, all three are results of Wollensak skills, facilities, painstaking research and engineering/manufacturing imagination . . . in a word, Wollensak flexibility.

Specialized customer products



High-speed photography





Fastax high-speed cameras allow the taking of motion pictures at frame rates of from 150 to 18,000 per second, so that phenomena moving too fast for the eye to see can be recorded permanently for leisurely study and analysis. By taking pictures at a rate many times faster than the normal projection speed, an ultra slow-motion film results, which, when shown on the screen, reveals events previously lost in the blur of speed.

A Fastax is, in effect, a time microscope, designed to "stop" motion, literally magnifying time. Fastax high-speed motion picture cameras are used extensively both on the production floor and in the laboratory. In essence, more than cameras, they are *engineering analysis tools*. Simple to operate, they have a multitude of applications, for both the small and the large manufacturer.

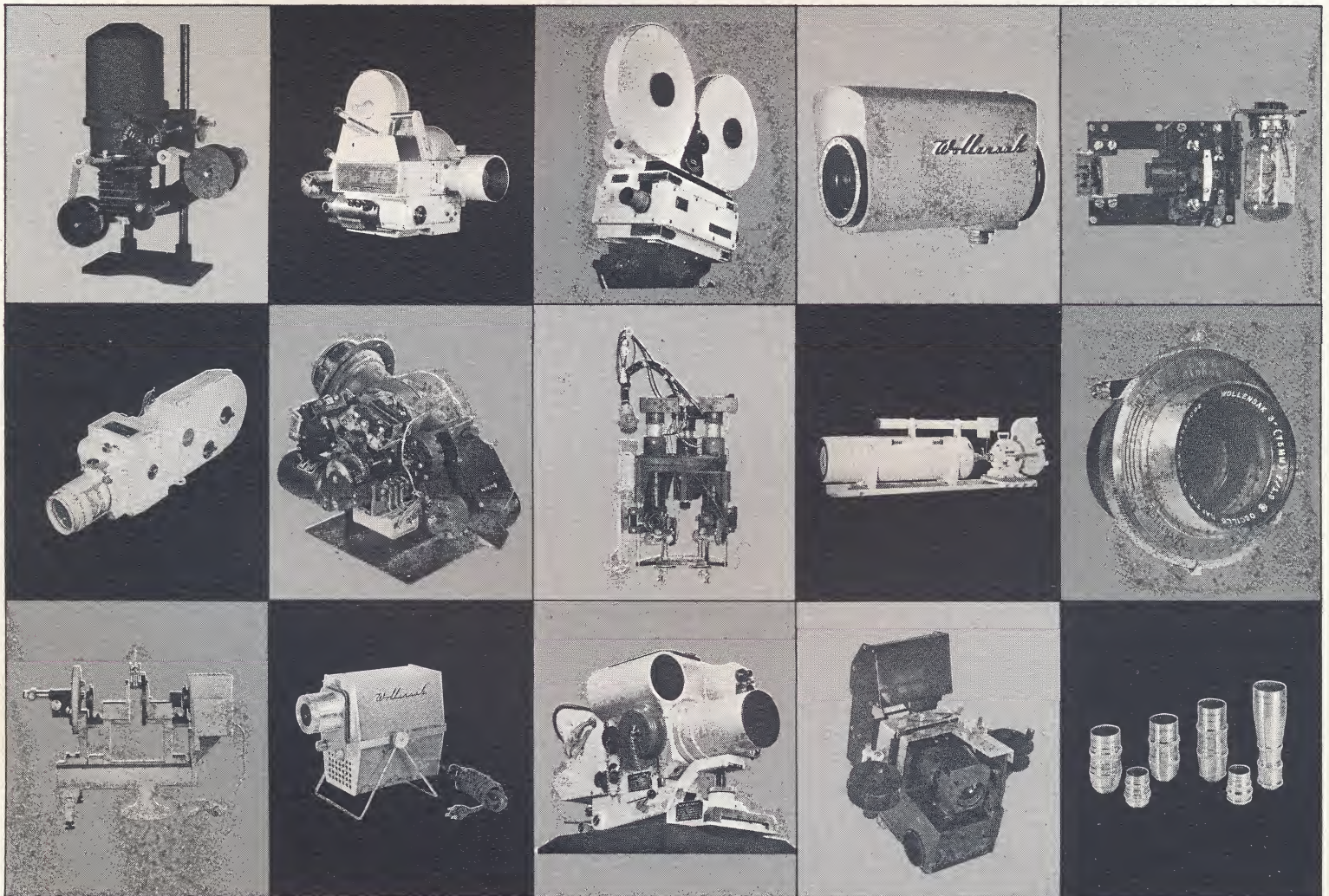
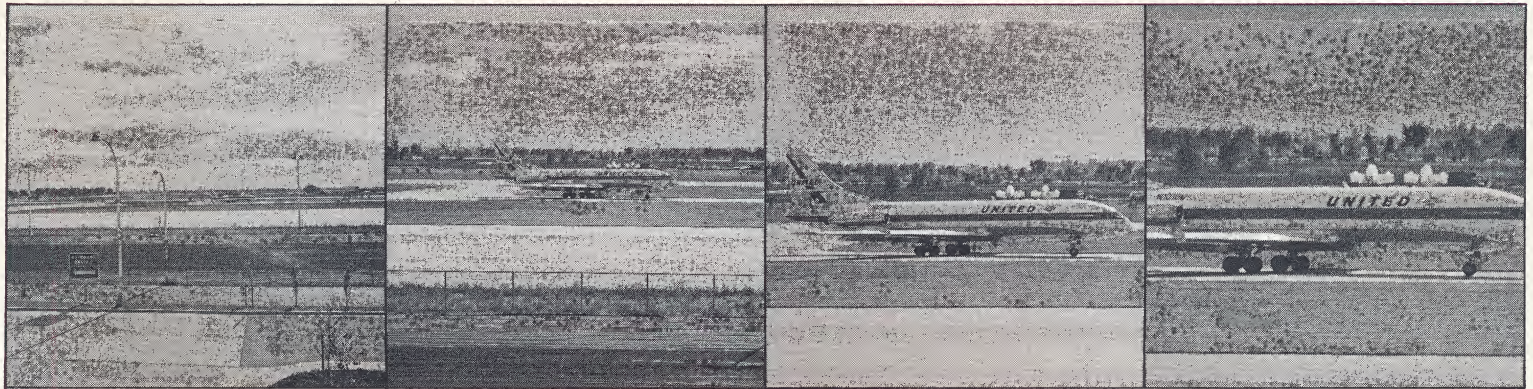
The Fastax group includes both straight motion picture and oscillographic cameras, and combined motion picture-oscillographic models.

The Fastair high-speed camera operates under the same basic principle as does the Fastax, with one very important difference—it is specifically designed for the documentation of rapid motion, acceleration and deceleration *while riding with the test vehicle itself*.

Compact and light-weight (it's the smallest, lightest high-speed motion picture camera ever developed), the Fastair takes up to 600 pictures per second. Providing strength, ruggedness and maximum rigidity, the Fastair is designed to withstand severe vibration and the extremely high "G" or Gravity Load Factor which occurs during rapid acceleration and deceleration.

On the ground or in the air, wherever a high-speed camera must be *on-the-spot*, this is where Fastair is used for an accurate, graphic demonstration of *what actually happens*.

Mirrrotel optical systems & other products



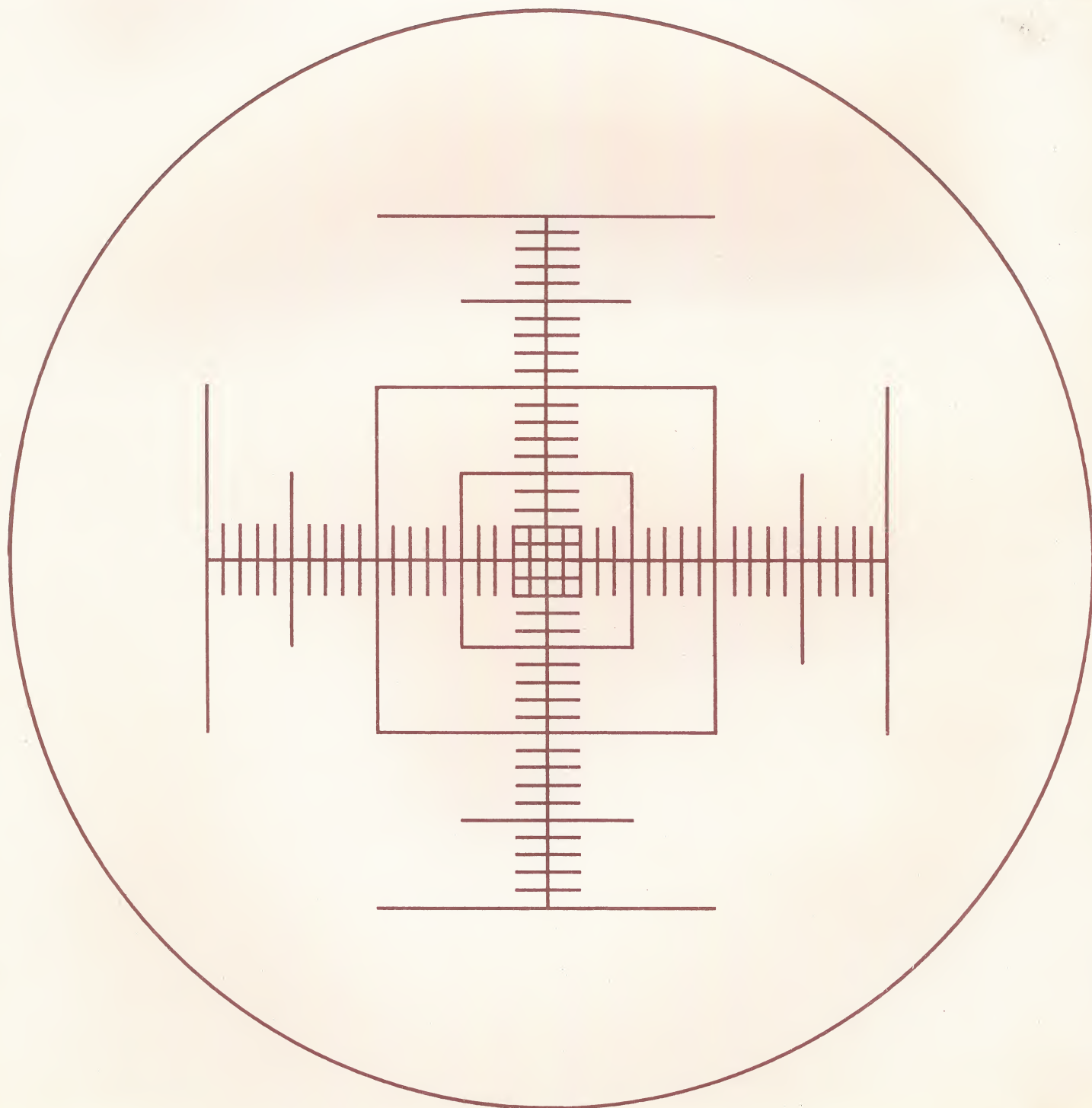
Wollensak Mirrotels are catadioptric, super-long focal length lens systems, developed specifically to satisfy the exacting requirements which long-distance radar boresight and surveillance devices depend upon.

Because the light path is reflected, or "folded" three times within the system, the length and weight of a Mirrotel are less than one-third those of an equivalent refractive telephoto objective, providing the all-important maintenance of resolution and physical stability.

Also, the lens and mirror elements of Mirrotel systems are housed within unique Invar temperature-compensated mountings, assuring flawless *line-of-sight accuracy* despite environmental changes in temperature, shock or vibration.

These are reasons why the Wollensak Mirrotel is called upon so often by government and industry to meet the varied and demanding needs of radar boresight and surveillance systems.

Whatever your requirements in the optical, opto-mechanical or mechanical fields, we invite you to make use of our advanced facilities and experienced craftsmanship. Our personnel are waiting to serve you—to help you transform your needs into products which fulfill them.

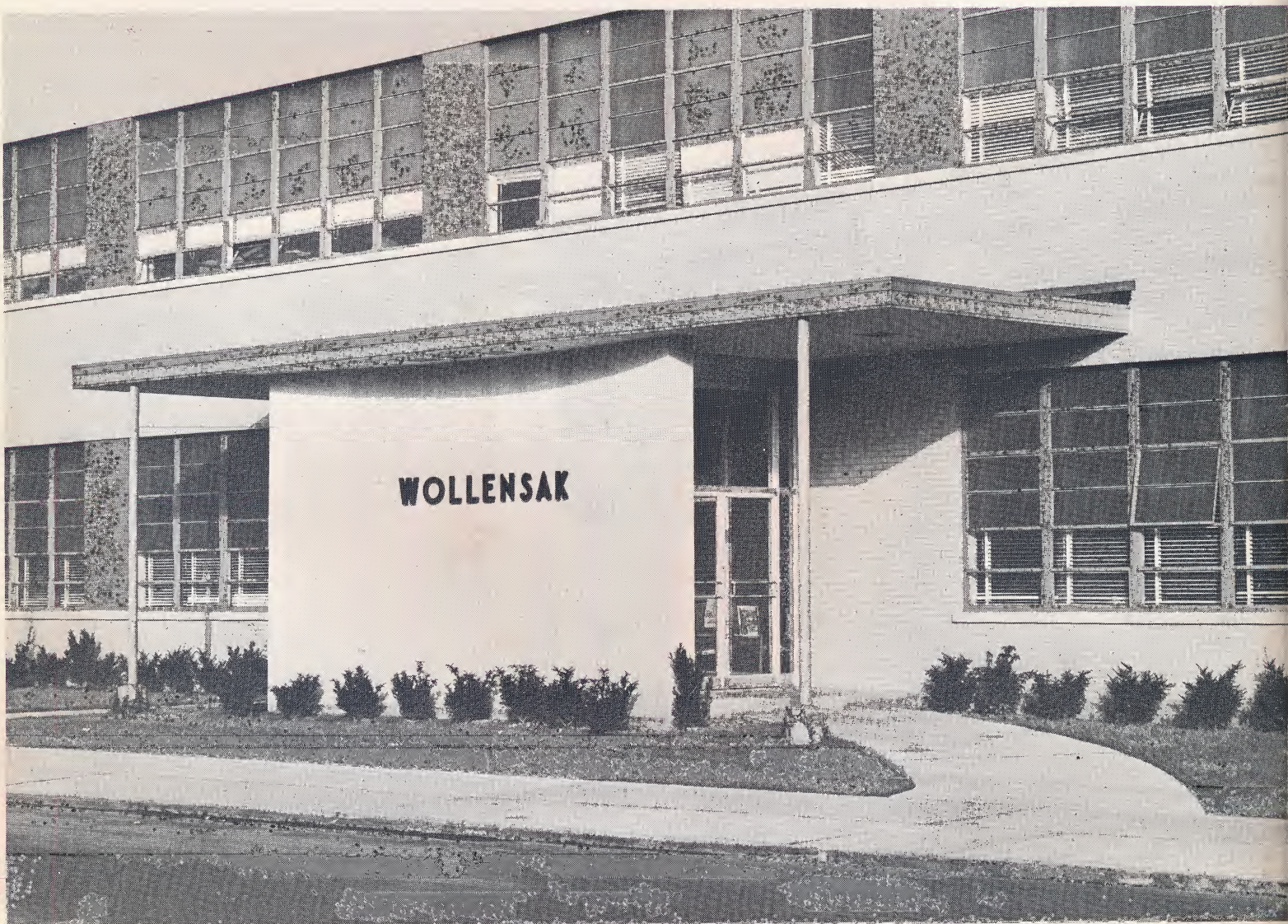




Revere-Wollensak Division

MINNESOTA MINING & MANUFACTURING CO.

850 HUDSON AVENUE • ROCHESTER, N.Y. 14621



November/December, 1971

COMPUTERIZED DESIGN SYSTEM



The Design Assistant/700 is a new turnkey computerized graphical design and drafting system for PC boards, ICs, hybrid circuits and schematic drawings. The system is constructed of a series of modules, each containing its own hardware and software. Each

module is capable of total stand-alone operation, or several terminal modules can be connected to a central communications and file storage facility. The system offers complete flexibility with typical disk or plotter options. It can be interfaced to other computer-aided design programs and NC machines, and may be connected as a remote terminal to larger computer systems.

Among the features: freehand input; turnkey operation - ready to go to work immediately; complete hardware/software system; plots complete documentation; manipulates graphical data in digital form; prepares NC data automatically; cuts design time from months or weeks to hours or minutes; high-speed storage - 4 million bits

Basic price for a complete system is \$60,000; delivery is 90 days for standard equipment.

Appicon Incorporated, Burlington, Mass.

Circle Reader Service No. 110

PERMANENT MAGNET STEPPER MOTORS



Designed to meet the critical performance requirements of computer peripherals, the new 72000 Series high

energy p.m. stepper motors can provide maximum stability over the full stepping range due to a unique rotor and stator design. The motors also furnish extremely high output power relative to their size.

Available to operate in increments of 15°, 30°, 45° or 90° per pulse, the motors can provide running friction torque up to 17 oz-in. at 100pps. Pull-in stepping rates range to 1500 steps/sec. Operating voltage is 26Vdc. Compatible logic drive circuit cards are also available. The A. W. Haydon Company, Waterbury, Conn.

Circle Reader Service No. 111

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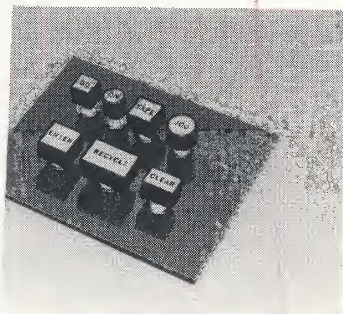


For any digit combi

You choose your function price, for easy, economical facing. This family of superior electrical, mechanical, human factors qualities for ductivity, high thru-put, I Available features include pass ("n" key-rollover audible feedback, and a second, one-shot out specs select the switch Corporation, 7 Sisson Ave Conn. 06106. (203) 233

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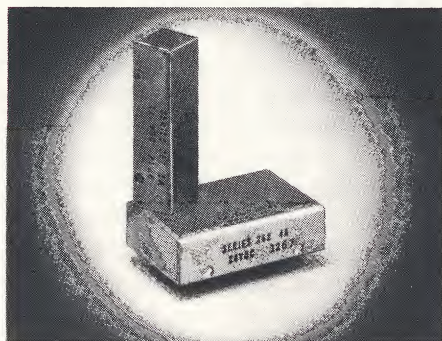
PUSH BUTTON S



TACOSWITCH C⁶ Series of pushbutton switches and indicators offers great versatility, wide switching power, choice of button colors, seven sizes, and ical prices. Gold plated switches are available for low-level ng, in addition to the standard contacts. The attractive dressing; the knurled dress nuts and sk opaque pushbuttons with lenses for no light spillage, vvide highly functional, at-control panels that blend modern industrial designs ors.

witches are rated at 3 amps @ 28 VDC or 115 VAC. These have been designed to meet preferences of forces and el and operate well in an ent of -55°C to +85°C. peration is available in d or momentary action. es start at \$2.40 for Indi- \$5.00 for Switches/Indicators pushbuttons) and can be in OEM quantities for as .36 and \$2.85. Switches are ly available from factory newly created network of /ITCH distributors. En- t stepped legends are

MINIATURE REED RELAYS



The Series 262 Miniature Reed Relay is a 10 watt unit featuring high speed and vibration resistance. Its compact size offers the circuit designer a greater degree of design flexibility.

The Series 262 Relays are safely cradled within a resilient shock absorbing frame. Individual protective cavities eliminate dangerous glass-to-glass contact. Handling and mounting stresses on the reed relay leads are absorbed by the protective frame. Also available is a Mercury Wetted version for applications requiring the highest order of switching reliability.

The 262 Miniature Reed Relay one pole version measures 7/16" high x 1-7/16" long x 29/64" wide. Weight: 5.7 grams. Coil Voltages: 5, 6, 12, 18, 24, 48Vdc. Contacts: Forms A, B or True C. Contact Rating: 10 Watts. Meets MIL-SID-202D for shock and vibration. Wheelock Signals, Inc., Long Branch, N.J.

Circle Reader Service No. 120

14 CONTACT DIP SOCKETS

These new 14 contact DIP sockets are designed with a low profile of 0.218" to provide high density packaging. Large, tapered entry channels aid IC insertion

REED RELAY SCANNER



The reedscan model 3000 is a systems oriented 3-wire or 6-wire reed relay multiplexer used for sequentially connecting from 2 up to 100 data sources to a single set of converting and recording equipment. The unit is a low cost, wide range, high performance instrument suitable for use in data acquisition systems. Because the unit is versatile and economical, it is used in both small and large scale data acquisition systems.

The scanning capacity can be easily expanded from the basic 10 channels up to 100 channels in ten channel increments. Channel identification lights give a visual presentation of the channel being monitored which facilitates manual operation and trouble shooting. In addition, channel identification is presented in 1248 BCD code at a back panel connector in DTL or TTL logic levels. Price of a basic 10 channel reedscan is \$995. Pivan Data Systems, Inc., Lincolnwood, Illinois.

Circle Reader Service No. 123

LAMINATED ALUMINUM BACK PANEL ASSEMBLIES

